



US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment



**Linda M. Sorn, P.E.**  
**Chief, Technical Services Division**  
**Chicago District**





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

USACE is authorized to operate and maintain:

- ❖ 120 Harbors
- ❖ 610 Miles of Channels
- ❖ 104 Miles of Breakwaters
- ❖ 20 Dredged Material Disposal Facilities





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

Navigation structures intended purposes:

- ❖ Safeguard navigation from wave and ice damage
- ❖ Protect critical city infrastructure (buildings, roads, power plants, water and wastewater treatment)
- ❖ Provide essential flood and storm protection





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

Harbor structures are exposed to powerful coastal forces (wind, waves, ice) many times each year







US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

- ❖ Over 80% of all coastal structures exceed 50 years of age
- ❖ 45% have never undergone a major rehabilitation effort
- ❖ Over 30% of structures have timber crib core sections; recent low water levels have accelerated deterioration of the wood





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

Constrained funding levels force difficult choices:

- ❖ Harbor infrastructure maintenance is no longer a federal budget priority
- ❖ Insufficient funding forces choices between Federal channel dredging and harbor coastal structure repairs
- ❖ With the current federal funding situation, the majority of harbor structures are not likely to be repaired in the foreseeable future





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

## Impacts of insufficient maintenance:

- ❖ Continued deterioration of harbor structures
- ❖ Reduced protection of coastal assets, putting critical city infrastructure at risk
- ❖ Increased shipping costs if failures occur in key commercial harbors
- ❖ Substantial damage to urban areas, with damages and replacement costs of harbor infrastructure being far greater than the investment required to maintain harbor infrastructure





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

## Corps' Planned Approach:

1. Prioritize limited funding to critical commercial harbor infrastructure using risk-based methodology
2. Initiate a dialogue with state and local officials to determine the best strategy for protecting vital harbor infrastructure that is no longer a budget priority





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

## Commercial Harbors:

- ❖ Established a team to develop consistent methods to assess harbor infrastructure condition and determine the risks associated with the potential failure of structures
- ❖ Use this information to prioritize limited federal funding in a manner that reduces risk to the Great Lakes navigation system.





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

## Low Budget Priority Harbors:

- ❖ Initiate a dialogue with state and local officials to inform them of the current condition of the infrastructure and the projected risks posed by deferred maintenance.
- ❖ Investigate options that would allow non-federal entities to assume maintenance responsibility for these structures





US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

## Strategy:

- ❖ Work collaboratively on a local, state, and federal level to prioritize limited resources
- ❖ Develop innovative, effective solutions to these serious challenges
- ❖ Breakwater brochure—initiation of communication strategy



US Army Corps  
of Engineers

# Great Lakes Navigation System Breakwater Reliability Assessment

(Insert image of brochure cover)

